



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

TRACHOMA IN STEEL MILL WORKERS.

AN INVESTIGATION OF THE ORIGIN AND PREVALENCE OF THE DISEASE AMONG THE EMPLOYEES OF THE YOUNGSTOWN SHEET & TUBE CO., YOUNGSTOWN, OHIO.

By J. W. SCHERESCHEWSKY, Surgeon, United States Public Health Service.

Introduction.

The Youngstown Sheet & Tube Co. is a corporation operating extensive steel works in East Youngstown, situated in the suburbs of Youngstown, Ohio. East Youngstown is a separate community, having its own local government and about 8,000 inhabitants, of whom some 60 or 70 per cent work in the company's mills.

It had been noticed for some time that there were a number of cases of trachoma among the employees of the Youngstown Sheet & Tube Co. The presence of the disease was discovered when such employees applied for treatment at the plant emergency hospital because they thought they were suffering from foreign bodies in their eyes.

The occurrence of trachoma among the factory personnel was reported by the company to the secretary of the State board of health, who in turn requested the Surgeon General of the Public Health Service to investigate the prevalence and origin of the disease.

The writer was detailed to perform this investigation, the results of which are set forth in the following pages.

Scope of the Investigation.

A preliminary conference was had with Dr. E. F. McCampbell, the secretary of the Ohio State Board of Health, at Columbus, Ohio. Through him it was learned that when the Youngstown Sheet & Tube Co. reported to the State board of health the presence of trachoma among their employees a medical officer was sent by the State board of health, who saw about 25 cases of trachoma in employees of the company, the diagnosis having been made by Dr. Hartzell, an oculist of Youngstown. These men had been dropped from the rolls of the company, and some of them were being treated at Dr. Hartzell's office.

At the time when the presence of the disease was discovered at the plant the community had become considerably excited over the danger. The cases were collected and segregated in the town jail. Later, however, they were discharged, and what had become of the patients could not be learned, though some of them had been returned to work by the company.

It was therefore determined to examine the eyes of as many as practicable of the factory personnel, in order to establish the rate of trachoma prevalence, and then to make an inspection of the sanitary conditions of East Youngstown (previously stated to be bad by Dr.

McCampbell), in order to see to what extent the disease was prevalent in that community, outside of the mills, as well as to note the general sanitary conditions and the existing opportunities for the spread of trachoma in schools and lodging houses.

The writer here desires to acknowledge the cordial cooperation of the Youngstown Sheet & Tube Co. in conducting this investigation, every facility having been extended for examining the mill operatives and assistance rendered in other ways.

Examination of the Employees of the Youngstown Sheet & Tube Co.

Number of employees.—When the mills are running full the company employs about 8,500 hands. At present, however, only about 80 per cent of the full force are at work, so that the number on the pay rolls at the time of investigation was somewhat in excess of 6,000.

Nationality of employees.—According to figures furnished by Mr. D. W. McClure, of the company's employment bureau, representatives of 20 different races and nationalities are employed at the works. The following table (Table 1) sets forth the percentage of each nationality or race at a recent time when the company was employing 7,518 persons. I am informed, however, that the percentages given are approximately correct for the present force.

TABLE 1.—*Distribution of nationalities of employees—The Youngstown Sheet & Tube Co.*

Nationality.	Per cent.	Nationality.	Per cent.
Americans.....	28.5	Scandinavians.....	1.1
Slovaks.....	18.3	Irish.....	1.0
Croatians.....	10.4	Lithuanians.....	.8
Roumanians.....	10.2	Welsh.....	.6
Poles.....	8.0	Scotch.....	.5
Magyars.....	6.6	Negroes.....	.5
Italians.....	5.8	Bulgarians.....	.5
Russians.....	3.2	Servians.....	.3
Germans.....	1.8	Greeks.....	.3
English.....	1.5	French.....	.1

From the above table it will be seen that 28.5 per cent of the employees are Americans, while 71.5 per cent belong to various foreign nationalities. Of these the Slovaks, Croatians, Roumanians, and Poles form 63 per cent of the alien representation.

Prevalence of trachoma among the employees.—Five thousand nine hundred and sixty-two employees of the Youngstown Sheet & Tube Co. were examined, the actual number on the pay rolls January 1, 1914, according to figures furnished by Mr. H. W. Kerr, the chief paymaster, being 6,372. Thus about 95 per cent of the employees were examined, the remainder, or 410, being, for the most part, office employees, employees unwilling to be examined, or employees on continuous night duty who were not accessible for examination.

As a result of the examination, 76 cases of trachoma were found, a rate of prevalence of 1.3 per cent. In addition to these, 19 cases of suspicious conjunctivitis were observed. These were in individuals presenting inflammatory eye symptoms of recent origin, suggestive of the onset of trachoma, but it was impossible to make a positive diagnosis at the time of examination.

Racial distribution of trachoma cases.—The racial distribution of the cases of trachoma and the rate of prevalence by races is shown in the following table (Table 2):

TABLE 2.—*Racial distribution of trachoma, and prevalence by race. The Youngstown Sheet & Tube Co.*

Race.	Approximate number of persons examined.	Number of cases of trachoma.	Rate of prevalence.
			<i>Per cent.</i>
Americans.....	1,700	4	0.23
Croatians and Servians.....	700	22	3.0
Italians.....	350	3	.9
Lithuanians.....	50	1	2.0
Magyars.....	500	15	3.0
Poles.....	550	2	.4
Roumanians.....	700	22	3.0
Slovaks.....	1,200	7	.7
	5,750	76

The difference in the total given above and the total examined (5,962) was made up of individuals of other races, none of whom presented cases of trachoma. The table also shows that the incidence was about the same in the Roumanians, Croatians, and Magyars—that is, 3 per cent—followed in order by Lithuanians with 2 per cent, Italians with 0.9 per cent, Slovaks with 0.7 per cent, Poles with 0.4 per cent, and, finally, Americans with 0.23 per cent. Eighty per cent of the cases of trachoma found were in the representatives of three races—Roumanians, Croatians, and Magyars—who form only about 28 per cent of the total number of persons examined.

Severity and duration of the infection.—Referring now to the severity and duration of the infection at the time of the examination, an analysis of the clinical notes gives the following results:

	Number of cases.	Per cent.
Mild cases.....	33	43.4
Cases of moderate severity.....	30	40.0
Severe cases.....	12	15.7
No longer active.....	1	1.3

In regard to duration an analysis of the notes gives the following findings:

	Number of cases.	Per cent.
Duration less than 6 months, including acute cases.....	32	43
Duration 6 to 12 months.....	21	28
Cases (1 year or more).....	22	30
Duration uncertain.....	1	1.3

It should be understood, of course, that the figures given as to the duration of the disease are mere approximations based upon the appearance of the ocular conjunctiva and the statements of the affected individuals. Still, it is thought that the observations are sufficiently reliable to justify the inference that the disease has, for sometime past, been slowly increasing among the factory personnel, in view of the circumstances that in some 42 per cent of the cases the infection was recent, certainly less than six and in a number of instances less than three months in duration. The inference as to the gradual increase of the disorder is still further strengthened by the occurrence of the cases of "suspicious" conjunctivitis previously mentioned.

Length of residence of trachoma cases in the United States.—In view of the fact that it is possible, because of the incubation period of trachoma (7–10 days), for an alien to land at New York without significant symptoms of eye disease, only to develop them a day or two after landing, some pains were taken to ascertain the length of time the individuals with trachoma had been in the United States.

It appears that four had been in this country less than one year, 15 from one to two years, two from two to three years, six from three to four years, nine from four to five years, and the remainder, or 40, five years and longer.

Of the four who had been less than one year in the United States, one had landed four months, one six months, one eight months, and one 10 months previously. All of these were recent cases of trachoma with the exception of the first, which presented the scars of old trachoma. The ocular conjunctiva, however, was smooth and the disorder had been apparently cured for years.

It seems probable, with but few exceptions, that the disease was contracted subsequent to landing in the United States, and in the great majority of instances during the time of the employment of these individuals by the Youngstown Co.

Distribution of trachoma cases by departments in the Youngstown Sheet & Tube Co.—Turning now to the distribution of the cases in

the various departments of the company, we find the following results (Table 3):

TABLE 3.

Department.	Number of employees.	Number of cases of trachoma.	Per cent.
Blast furnace.....	315	4	1.3
Bessemer plant.....	730	8	1.1
Electrical.....	150	1	.66
Mechanical.....	500	2	.4
Open-hearth plant.....	150	1	.66
Rod and wire mill.....	1,100	7	.63
Sheet mill.....	850	11	1.3
Tube mill.....	1,600	30	1.9
Yard and construction.....	400	7	1.7

It is seen from the above table that trachoma is most prevalent in the tube mill and in the yard and construction gangs. This does not seem to be due to any special conditions in these departments favoring the spread of trachoma, but to the fact that these departments employ the greatest percentage of Roumanians, Croatians, and Magyars, who, as already shown, present the highest incidence of the disease.

Dissemination of trachoma in the mills.—It is not thought that the disease has been spread to any very great extent by conditions in the mills. The special conditions favoring the spread of trachoma in workshops are close physical contacts and the use of the common towel and hand basin.

In regard to the first condition the degree of physical contact among steel workers is not very close. The floor space in steel plants is usually taken up by equipment of various kinds, the cubic feet of space per employee being very great. In none of the shops did the employees seem to be brought into prolonged or close physical contact with each other.

In regard to the use of washing facilities in common at the mills, it is not probable that here the dissemination of trachoma is more than occasionally effected in this way. In common with most steel plants, there are practically no washing facilities provided for the employees by the Youngstown Sheet & Tube Co. with the exception of the office force. In their case, paper towels are provided, which are destroyed after being used once.

The workmen either go home without washing, wash up in buckets they provide themselves, or in the troughs where tongs and similar tools are cooled off after being used in handling hot metal. While, of course, the use of such buckets by several individuals in common might readily transmit trachoma, it was observed that only the more skilled workmen seemed to make a practice of washing up after work, while the majority of the foreign element, who are, for the most part,

unskilled laborers, postponed washing until they reached their lodging houses. The amount of trachoma observed in skilled workmen—nearly all American, Scotch, Irish, and English—was not significant. Therefore, it seemed probable from the relative absence of the disease among the more highly paid skilled contingent who do wash up before leaving, that the disease has not been extensively transmitted by the use of common towels and washing utensils at this plant.

In addition to the conditions just discussed there is still a way in which some cases of trachoma may have been acquired at the plant, and that is through the practice which exists among the workmen of removing foreign bodies from each others eyes. While the regulations of the company require all workmen with foreign bodies in their eyes to go for relief to the emergency hospital maintained by the company, in practice, whenever the foreign particle consists merely of dust or cinder, the workmen frequently have recourse to each other for assistance. In this way it is possible for a trachomatous individual, using his presumably infected fingers or handkerchief for the purpose, to infect the eyes of a fellow workman or, conversely, a trachomatous subject, believing, from the ocular sensations caused by the disease that he has a foreign body in his eye, similarly to infect the fingers or handkerchief of the workman who undertakes to remove it. Such possibilities for the transmission of trachoma are, of course, rather far-fetched. They would not deserve consideration were it not for the great frequency with which foreign bodies get into the eyes in steel plants.

On the whole the impression was gained that the conditions favoring the spread of trachoma could not prevail in the steel plant to the same extent as in the workmen's homes and lodging houses; therefore attention was directed to the sanitary conditions in East Youngstown and their relation to the dissemination of the disease.

Sanitary conditions in East Youngstown.—Owing to the fact that the great majority of the alien employees are either single, or that their families are still in Europe, they live from motives of economy and convenience in lodging houses in East Youngstown. An inspection of this town and the lodging houses made it plain that sanitary conditions there were most unsatisfactory. The conditions in lodging houses were such as not only greatly to facilitate the spread of trachoma, or, for that matter, of any communicable disease, but to cause one to wonder why the disease is not more prevalent than it is.

East Youngstown is situated upon a slope on the banks of the Mahoning River, in close proximity to the plant of the Youngstown Sheet & Tube Co. Many of its streets are practically ungraded and sidewalks are, for the most part, absent. Though a line of sewer has been laid, almost without exception all the houses are still unconnected.

There is no system of garbage collection, garbage being dumped in the rear of houses where it is apt to remain until disintegrated by the elements. A water company, the Mahoning Water Co., exists in the vicinity. It has laid pipes in the town, but only a few houses are supplied. The great bulk of the water is derived from shallow driven wells, each house having its pump. Because of the absence of a water-carriage sewerage system, and a public water supply, the outdoor privies were practically the only means of excreta disposal. These were for the most part of the insanitary type and, in the majority of instances, in foul condition.

Owing to the slope of the land upon which the town is built, extensive opportunity exists for surface contamination, the contents of privies and the washings from garbage heaps draining abundantly toward wells on lower levels. As a consequence, many of the wells are exposed to pollution.

By reason of the tendency of workmen of the same race to lodge in the same section of town, the lodging houses exhibited many instances of extreme overcrowding. Thus, in one case, there were 23 lodgers in a four-room house, and it was by no means uncommon to find a single room occupied by from 8 to 12 workers. The lodgers, for the most part, slept two in a bed.

In some of the lodging houses, where the men work on both "day and night turns," the occupation of the beds is almost continuous, the night men taking, during the day, the places of those sleeping at night in the beds.

The beds themselves were usually old and in filthy condition, destitute of bed linen, the covers consisting of old bedquilts. The washing facilities consisted of buckets, or hand basins, which were used in common by all the occupants of a room. The houses themselves were for the most part built close together, so that the rooms were dark. Very few of the rooms were susceptible of thorough ventilation. Indeed, but little advantage would have been taken of such a provision, as all windows were found carefully closed and the temperature was still further raised by small stoves.

It is plain from the foregoing that the conditions in the lodging houses are very favorable for the propagation of trachoma.

The sanitary authority of East Youngstown consists of a local health officer—a layman who has had no training in sanitation, very little knowledge of the functions of a health officer, and no funds for performing any sanitary work.

Examination of the East Youngstown schools.—It was thought that an examination of the school children would give a very fair idea of the extent to which trachoma was disseminated among the non-occupied population of East Youngstown. Through the courtesy of Mr. C. W. Ricksecker, the superintendent of schools of Coitsville Township, an opportunity was afforded for making such examination.

The schools of East Youngstown are four in number, as follows: The old Gordon Avenue School, the new Gordon Avenue School, the Stop 7 School, and the Fairview School. All the pupils (652 in number) in these schools, together with the teachers, were examined with the result of finding 10 cases of trachoma—a rate of prevalence of 1.53 per cent.

The following table (Table 4) gives the name of the school, the number of pupils of either sex, and the sex and number of cases of trachoma found:

TABLE 4.—*Trachoma in East Youngstown school children, by school and sex.*

Name of school.	Number of boys.	Number of girls.	Total.	Cases of trachoma—boys.	Cases of trachoma—girls.	Total cases, trachoma.
Old Gordon Avenue.....	64	42	106	1	0	1
New Gordon Avenue.....	151	119	270	3	5	8
Stop 7.....	44	28	72	0	1	1
Fairview.....	116	88	204	0	0	0
Total.....	375	277	652	4	6	10

It is seen from this table that the greatest number of cases of trachoma existed at the New Gordon Avenue school. This school with 270 pupils, or about 41 per cent of the entire number examined, showed 8 cases of trachoma, 80 per cent of the total cases of the disease found among the East Youngstown scholars.

This school is situated in that district of the town having the greatest number of lodging houses. There were no cases found at the Fairview School, which is located at the extremity of the town nearest Youngstown. This portion of East Youngstown presents better sanitary conditions than the remainder. The houses are better and less closely spaced. The proportion of Americans is also higher.

While, therefore, the rate of prevalence of the disease among the East Youngstown school children is not very high, being about 1½ per cent, the disease is, nevertheless, present, and some action on the part of the local authorities is needed in order to prevent its further dissemination.

Conclusions.

1. The origin of the prevalence of trachoma among the employees of the Youngstown Sheet & Tube Co. is readily accounted for by the presence among them of chronic cases of the disease, some of which are even now in a state of acute exacerbation.

2. The crowded insanitary condition of the lodging houses, where a large proportion of the employees live, amply accounts for the spread of the disease.

3. The presence of recent cases of trachomatous infection shows that under existing conditions the disease is gradually being spread.

Unless measures are now undertaken for its control the prediction seems justified that the disease will gradually gain such headway as perhaps to prevail in epidemic form.

4. It seems evident that so long as the present insanitary conditions obtain in East Youngstown the control of trachoma will be difficult or impossible unless measures to this end go hand in hand with betterment in the local sanitary conditions.

5. The present machinery for the control of the situation is unsatisfactory. The local health officer of East Youngstown is a layman, without the knowledge or training in sanitation to enable him to cope with the situation.

The town itself lacks completely the fundamentals for sanitation, namely, a public water supply, water carriage sewerage system, system of garbage collection and disposal, physical supervision of school children, proper grading of streets, and provision for the disposal of the surface washings and storm waters, even the numbering of houses, so that the location of cases of communicable diseases can be recorded. There are also no local dispensaries or hospitals, except the emergency hospital of the Youngstown Sheet & Tube Co., which is located in the plant.

Recommendations.

In view of the fact that some 80 per cent of the taxes of East Youngstown are paid by the Youngstown Sheet & Tube Co., and that 60 to 70 per cent of their personnel, including nearly all the foreign element, live in East Youngstown, it would seem as though the Youngstown company is more directly interested in the sanitary conditions in East Youngstown than anyone else.

The efficiency of its employees is affected, not only by their environment when at work but also by that of their homes. It is evident that when workmen are exposed to insanitary surroundings during their period of rest, not only do they incur the danger of contracting communicable diseases but their ability to recuperate from their previous labor is adversely affected by the prevailing unhealthful conditions.

Any effective treatment of the situation must necessarily include specific measures to be adopted at the mills and also the betterment of the sanitary conditions in East Youngstown if permanent results are to be secured.

The recommendations made, therefore, related to two separate ends; first, the treatment of the situation at the mills and, second, the sanitation of East Youngstown.

Besides calling the attention of the company to the usual means for preventing trachoma, such as avoiding the use of the common towel and hand basin and the use of the same bed by two or more

individuals, the following special recommendations were made for the company to put into effect at once:

1. No time should be lost in securing a competent physician on full time, at an adequate compensation, who should perform the following duties:

(a) Make a complete mental and physical examination of persons applying for employment with the company.

(b) Give competent treatment to any individuals found to be afflicted with trachoma or other communicable diseases.

(c) If the necessary arrangements could be made this physician could also be the health officer for East Youngstown and supervise its sanitary condition.

2. A competent graduate trained nurse should be secured who would be able to administer treatment to trachoma cases under this physician's direction.

3. All individuals named in a list furnished the company who are suffering from trachoma, and with respect to whom the notation "acute," "recent," or "severe" was made, should be segregated, preferably in some building controlled by the company, and there furnished competent medical treatment until such time as the infectiousness of the disease has been removed. They could then be allowed to return to work conditionally upon their reporting daily to the hospital for inspection and treatment.

4. All persons suffering from trachoma, including those segregated in the manner just referred to, should, upon their return to work, be required to report for inspection and treatment twice daily at the hospital. It was suggested, in order to secure easy compliance with this recommendation, that these persons secure their time cards at the hospital and the fact of their having there reported, on going in and out, be attested by a special stamp kept at the hospital.

5. In order to prevent the development of subsequent cases, foremen, or those in charge of gangs, should be required to submit semi-weekly reports as to the appearance of the eyes of men under their control. Such reports should not be perfunctory, but should state affirmatively or negatively whether they have observed any cases of reddened or sore eyes in any of the men under their charge. Whenever the eyes of any workmen appear red or sore such workmen should be sent at once to the hospital for examination.

The following recommendations as to the improvement of the sanitary conditions of East Youngstown were made, their realization to constitute part of the future policy of the company, as an equivalent for the large taxes paid by the corporation:

1. The provision of an adequate and pure water supply.
2. The installation of a water-carriage sewer system.
3. The abolition of insanitary privies.

4. The installation of catch basins and sewers for disposal of storm waters.

5. The installation of a system of garbage collection and disposal, with ordinances as to the use of sanitary garbage cans with tight-fitting covers.

6. Restriction of overcrowding in lodging houses and regulation of their sanitary condition by a system of licensing and inspection.

7. Numbering of houses and grading of streets.

8. Physical supervision of the children in the schools.

9. The appointment of a properly qualified physician as health officer.

10. Establishment of a hospital and dispensary in East Youngstown.

[NOTE.—It is gratifying to learn from a letter received from Mr. Woltz, the director of safety of the Youngstown Sheet & Tube Co., that the recommendations in regard to the treatment of trachoma cases have already been carried into effect.]